

### **3. CURRENT POLICIES**

Under President Xi Jinping's leadership, China is in the midst of far-reaching reforms. Proposed economic reforms are especially ambitious. The 60-point decision released by the Chinese Communist Party's Third Plenum in November 2013 calls for market forces to play a "decisive" role in the economy (within the context of government policy and excluding natural monopoly situations). The decision charts an agenda that includes land reform, private investment in state-owned enterprises, fewer investment restrictions, interest rate liberalization and much more.<sup>1</sup>

This reform agenda will shape China's shale gas sector. China's success in meeting its shale gas goals will be determined not just by shale gas-specific policies (which are described in detail below), but also by the reform agenda more generally. Reducing corruption, reforming the legal system, protecting intellectual property rights, strengthening environmental regulatory regimes and liberalizing investment (such as with a U.S.-China bilateral investment treaty) will all help promote progress in meeting shale gas goals. The leadership's strong commitment to reform can help advance shale gas goals, although uncertainty over which reforms will receive priority and the pace at which those reforms will proceed could have the opposite impact.<sup>2</sup>

The following sections describe Chinese energy policies broadly, summarize central and provincial government shale gas policies, explain natural gas pricing and pipeline policies (both of which are important for shale gas production) and review Chinese investment in the U.S. shale gas sector.

#### **A. Chinese Energy Policies**

China's energy policies have undergone major changes over the past decade, as the country copes with the enormous challenge of meeting rapidly growing energy demand while shifting energy production and consumption away from coal. On the production side, the government has focused on promoting wind, solar, nuclear, hydro and natural gas. Among these, natural gas is seen as a key enabling fuel, especially in the power sector, where China needs flexible fuel sources to integrate intermittent renewable sources and meet increasingly variable loads. For gas, policies have included targets, pricing reforms, subsidies and structural reforms within the historically state-dominated sector. China's top leadership has identified reforms in the natural gas sector as a high priority on several occasions.

In November 2012, President Hu Jintao's report to the 18th National Congress of the Communist Party spoke of the need for an "energy revolution," using language uncommon

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<sup>1</sup> 18th Central Committee of the Communist Party of China, Decision of the Central Committee of the Communist Party of China on Some Major Issues Concerning Comprehensively Deepening the Reform (Nov 15, 2013), Xinhua, -- [http://news.xinhuanet.com/politics/2013-11/15/c\\_118164235.htm](http://news.xinhuanet.com/politics/2013-11/15/c_118164235.htm)

<sup>2</sup> See generally Barry Naughton, "Deepening Reform: The Organization and Emerging Strategy," *China Leadership Monitor* (Summer 2014); Arthur R. Kroeber, *Xi Jinping's Ambitious Agenda for Economic Reform in China* (Brookings, November 17, 2013).

for such communications.<sup>3</sup> In June 2014, the Central Party's Leading Group on Economic and Financial Affairs, chaired by President Xi Jinping, met to discuss energy security. President Xi then made a speech announcing the following five-part strategy:

- Promote **revolution in energy consumption**, to restrict irrational uses of energy. Measures include the determination to control the country's total energy consumption volume, effectively implement energy saving strategy across all sectors and throughout the economic and social development process.
- Promote **revolution in energy supply**, to build a diversified supply system. Measures include progressing on clean and efficient uses of coal, actively developing non-coal energy resources, while strengthening energy transmission and distribution networks and energy reserves.
- Promote **revolution in energy technology**, to foster industrial upgrading. Measures include promoting green and low carbon innovations in technology, industry and business models, and combing technological progress in other areas to form a new powerhouse for economic growth.
- Promote **revolution in energy governance**, to pave a fast track for energy development. Measures include firmly progressing reform to give energy back its commodity nature, building a competitive market, forming a mechanism where market determines energy prices, changing the way government regulates energy industry and building a system of rules by the law.
- Strengthen **international cooperation in an all-around manner**, to ensure energy security under open market conditions. Measures include promoting international cooperation in every aspect of the energy production and consumption to effective use international resources.<sup>4</sup>

While state-owned enterprises (SOEs) continue to dominate the energy sector, mixed ownership and investment diversification is being pursued in a number of areas. On July 15, 2014, the State-owned Assets Supervision and Administration Commission (SASAC) selected eight national SOEs to implement mixed-ownership and management reforms.<sup>5</sup> Meanwhile, CNPC and Sinopec have started their own mixed-ownership reform initiative. Sinopec announced it will open its retail business for private investors, and CNPC has announced it will strip off its core pipeline assets. Allowing private investors, including foreign investors, to take a minority stake in SOEs could promote transparency, improve governance and speed technology transfer. At the same time, skeptics have noted the

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<sup>3</sup> President Hu Jintao, report to the Eighteenth National Congress of the Communist Party (November 8, 2012).

<sup>4</sup> Xinhua Daily Telegraph, "Xi Jinping: Promote Energy Production and Consumption Revolution" (June 14, 2014), -- [http://news.xinhuanet.com/politics/2014-06/13/c\\_1111139161.htm](http://news.xinhuanet.com/politics/2014-06/13/c_1111139161.htm); Translation from Beijing Energy Club, China's Call for Energy Revolution (July 2014).

<sup>5</sup> State-owned Assets Supervision and Administration Commission, Press Conference on Four Reform Pilot (July 15, 2014).

potential for strong resistance to such changes. If private minority stakes are just treated as a capital injection, it could paradoxically represent a setback for market reforms.<sup>6</sup>

Energy sector reform is a centerpiece of China's current economic restructuring. Within the context of energy sector reform, shale gas has the potential to be especially important for at least two reasons. First, China's vast shale gas resources could help the country meet a number of its energy policy goals, including cutting coal's share in the power sector and reducing reliance on imports. Second, many of the policies needed to realize China's shale gas potential could have applicability in other contexts. Market-based reforms will be especially important to shale gas development, for example. Technological innovation and new forms of international cooperation will also be key. If China succeeds in developing its shale gas potential by accelerating market-based reforms, promoting technological innovation and fashioning new forms of international cooperation, the experiences and lessons learned could have ripple effects in reforms in the energy sector and economy as a whole.

## B. Central Government Shale Gas Policies

The Chinese central government strongly supports shale gas production and incentivizes it with a number of policies. The principles guiding Chinese shale gas policies are set forth in the Shale Gas Five-Year Plan (March 2012), which declares the government's strong support for shale gas production and commits to production incentives, accelerated permitting, improved infrastructure and technology innovation. More detailed policies are set forth in the Shale Gas Industry Policy (October 2013), which designates shale gas development a "national strategic new industry," and other official documents.<sup>7</sup>

At least a half-dozen ministries and agencies play a role in Chinese shale gas policy. The National Development and Reform Commission (NDRC) shapes overall policy and regulates natural gas prices. The National Energy Administration (NEA) establishes shale gas production targets. The Ministry of Land and Resources (MLR) controls mineral rights and runs the bid rounds for shale gas. The Ministry of Finance (MOF) administers a shale gas production subsidy. The Ministry of Science and Technology (MOST) funds research and development in shale gas technologies. The Ministry of Environmental Protection (MEP) establishes rules to protect air and water quality.

Central government policies to promote shale gas include:

- production targets,

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<sup>6</sup> Dexter Roberts, "Is China Rethinking the Dominance of Its State Sector?" *Bloomberg Businessweek*, March 14, 2014; Jing Song, "China's SOE Revamp May Lead to Problems," *FinanceAsia*, April 12, 2014.

<sup>7</sup> NDRC, MOF, MLR and NEA, Shale Gas 12th Five Year Plan, March 2012, <http://www.cbichina.org.cn/cbichina/upload/fckeditor/Full%20Translation%20of%20the%2012th%20Five-Year%20Plan.pdf>; and Shale Gas Industrial Policy, NEA, October 2103, <http://www.sidley.com/Chinas-First-Shale-Gas-Policy-11-12-2013/>. For other official documents, see in particular Notice on Strengthening the Exploration and Exploitation of Shale Gas, MLR, October 2012, [http://www.morganlewis.com/pubs/greaterchina\\_if\\_chinashalegasdevelopment\\_29nov12.pdf](http://www.morganlewis.com/pubs/greaterchina_if_chinashalegasdevelopment_29nov12.pdf); see also <http://www.nortonrosefulbright.com/knowledge/publications/64620/chinas-12th-five-year-plan-for-shale-gas>.

- a production subsidy,
- waivers of price controls and fees,
- listing of shale gas as an independent mineral resource, and
- publication of a shale gas industry standard.

The government's shale gas production targets are 6.5 bcm per year by 2015 and 60–100 bcm by 2020. CNPC and Sinopec have each been directed to do their part to ensure these targets are met. On August 7, 2014, Reuters reported that NEA had cut China's 2020 production target for shale gas to 30 bcm.<sup>8</sup> As of this writing, NEA has not issued any official announcement changing its production target.

The Ministry of Finance provides a production subsidy of 0.4RMB/cubic meter of shale gas. (This is equivalent to roughly \$1.83/Mcf.) This subsidy expires in 2015. No decisions have been announced with respect to the amount of production subsidy — if any — past 2015.

There are other fiscal benefits for producing shale gas. Perhaps most important, shale gas may be sold at market prices, except when being sold into the residential market. (Natural gas in China is subject to a complex system of price controls, with prices varying from city to city and depending on whether production sources are “old” or “new.”) In addition, several fees generally charged in connection with natural gas production — including the exploration right fee and mineral resource compensation fee — are waived for shale gas.

By decision of the State Council, shale gas is listed as an independent mineral resource. That decision has far-reaching consequences. For example, it provides private companies the opportunity to invest in shale gas production. (Only the major NOCs are allowed to engage in exploration and production of conventional natural gas.) Listing shale gas as an independent natural resource also provides MLR more discretion in establishing policies to promote shale gas.

The Ministry of Land and Resources has held two rounds of bidding for shale gas blocks and is planning a third. The first round was held in 2011. Six state-owned enterprises — CNPC, Sinopec, CNOOC, Yanchang Petroleum, CUCBM and Henan CBM — were invited to compete for four blocks. Sinopec and Henan CBM each won one block. (The other two blocks were not awarded.)<sup>9</sup> The second bid round opened in September 2012, with MLR offering 20 blocks to any Chinese company with at least 300 million RMB registered capital. (Foreign companies were permitted to participate only as minority partners in joint ventures.)<sup>10</sup>

Nineteen blocks were awarded in the second bid round, to 17 SOEs and two private companies. Though SOEs won almost all of the parcels, private companies represented a

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<sup>8</sup> Chen Aizhu et al., “China Finds Shale Gas Challenging, Halves 2020 Output Target,” Reuters, (August 7, 2014), <http://www.reuters.com/article/2014/08/07/us-china-shale-target-idUSKBN0G71FX20140807>.

<sup>9</sup> See Yuping He, China: A Brief Analysis Of Shale Gas Industry Policies, May 23, 2014, <http://www.mondaq.com/x/316130/Oil+Gas+Electricity/A+Brief+Analysis+Of+Shale+Gas+Industry+Policies>.

<sup>10</sup> MLR, Shale Gas Exploration Right Bidding Announcement, September 10, 2012, [http://www.mlr.gov.cn/zwgk/zytz/201209/t20120910\\_1139187.htm](http://www.mlr.gov.cn/zwgk/zytz/201209/t20120910_1139187.htm).

third of bids.<sup>11</sup> China Huadian and Shenhua both won parcels, with China Huadian capturing five parcels — over a fourth of the blocks awarded. Companies that dominated the first bidding round — CNPC, Sinopec, CNOOC and Yanchang Petroleum — didn't win any parcels.<sup>12</sup> This is possibly because these firms had been given priority in overlapping parcels according to a notice from MLR, and most of the shale parcels were in this overlapping area.<sup>13</sup>

Progress since the bidding results were released has been slower than expected. The parcels offered were generally considered to be of poor quality, and many of the firms that won parcels lacked oil and gas exploration experience.<sup>14</sup> Some bid winners have reportedly tried to transfer their exploration rights on the parcel. According to Southern Weekly, the transfer negotiation between Chongqing Energy Investment Corporation and CUCBM on the Qianjiang parcel is in the final stages of discussion.<sup>15</sup>

In April 2014, MLR published technical standards for shale gas reserve and production calculations. MLR sets forth specific methodologies and criteria that developers must use, with the aim of standardizing data presentations and promoting transparency. MLR also sets forth a specific definition for shale gas:

“Shale gas often occurs in mud shale and is interlayered with rich organic matter. Shale gas is a kind of unconventional natural gas in a form of adsorption or free-state. Shale gas is a type of clean energy resource, and is mainly composed of methane.”<sup>16</sup>

Although foreign companies are not allowed to participate directly in oil and gas exploration, their involvement in JVs has been actively encouraged, and there are a number of international JVs established, indicating both an eagerness of foreign firms to participate and the desire of Chinese firms to gain from foreign expertise and experience. Foreign firms in JVs include Shell, BP, Total, Newfield, Chevron, ExxonMobil, ENI, and ConocoPhillips. SOEs and private firms have also reached out to international oil services firms, including Schlumberger, Halliburton and BakerHughes. Most recently, Sinopec announced the formation of an oil services JV with Weatherford International to develop products related to shale production in regions with high pressure and temperatures.

In several respects, China's shale gas policies resemble those from the early stages of U.S. shale development. Like the United States in the 1970s and 1980s, China has introduced government subsidies, provided government funding for research and development and

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<sup>11</sup> MLR, The Second Round Of Shale Gas Exploration Right Bidding Result, January 21, 2013--  
[http://www.gov.cn/gzdt/2013-01/21/content\\_2316805.htm](http://www.gov.cn/gzdt/2013-01/21/content_2316805.htm).

<sup>12</sup> Ibid.

<sup>13</sup> “Four Oil Companies Enjoy Shale Gas Exploration Rights in the Overlapping Area,” *China Securities Journal*, November 24, 2012, [http://www.cs.com.cn/ssgs/hyxx/201211/t20121124\\_3746705.html](http://www.cs.com.cn/ssgs/hyxx/201211/t20121124_3746705.html) [tz]

<sup>14</sup> “Progress For the Second Bid Parcels Was Slow,” *China 5e*, October 18, 2013,  
<http://www.china5e.com/news/news-849286-1.html>.

<sup>15</sup> “The Bid-Winning Companies in the Second Round Made Slow Progress,” *Southern Weekly*, July 19, 2013, <http://www.infzm.com/content/92489>.

<sup>16</sup> China Economic Net, Plan for Shale Gas Sector 2011–2015, February 1, 2013,  
[http://www.ce.cn/cysec/ny/zcjd/201302/01/t20130201\\_21331779.shtml](http://www.ce.cn/cysec/ny/zcjd/201302/01/t20130201_21331779.shtml).

taken steps to both deregulate natural gas prices and provide open access to pipeline networks.<sup>17</sup> In other ways, however, the policy approaches differ. China has taken few if any steps toward private ownership of mineral rights or requiring public disclosure of geologic or shale gas production data.

### C. Provincial Shale Gas Policies

Chinese provincial governments have strong interests in shale development within their borders. For many provincial officials, the highest priority may be the GDP increase likely to accompany shale gas development. Provincial officials may hope to use the shale gas produced for local needs. Provincial officials also have strong interests in preventing any environmental damage or social disruption from shale gas production.

To date, provincial governments have used at least three tools for shale gas development: shale gas development plans, standards and joint ventures.

- Three provinces — Sichuan, Chongqing and Guizhou — have released shale gas development plans. (Other provinces, including Xinjiang, refer to shale gas in comprehensive plans for oil and gas development.)
- At least one province — Hunan — has released local technical standards on shale gas drilling.<sup>18</sup>
- Several provinces — including Sichuan, Chongqing, Xinjiang, Hunan and Anhui — have formed joint ventures with SOEs active in shale such as Sinopec, CNPC, CNOOC or China Huadian Corporation. Such joint ventures may help provincial governments capture some of the economic benefits from shale gas production, although they may also lead to regional monopolies and discrimination against other developers.

Current policies in several leading provinces are summarized below.

#### (i) Sichuan

In July 2013, the Sichuan Development and Reform Commission and Energy Administration published the Sichuan Shale Gas E&P 2013 Work Plan.<sup>19</sup> The plan sets production and investment targets, lists Yibin (Changning block) as a pilot within the province and sets a target of 1 bcm of production from Changning.

In December 2013, Sichuan Changning Gas Development Company was founded with 1 billion RMB of registered capital. The company has four shareholders — CNPC (55%), Sichuan Energy Investment Group, a provincial SOE (30%), Yibin State-Owned Assets Operation Co Ltd., a local SOE (10%) and Beijing Guolian Energy Industry Investment Fund

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<sup>17</sup> Suttikulpanich et al., “China Shale Gas: Potential Unearthed,” p. 25, at note 30.

<sup>18</sup> Lingli Yan and Liqing Zou, “A Golden Path to the New Energy Strategic Landscape,” July 24, 2014, [http://www.zgkyb.com/observation/20140724\\_5945.htm](http://www.zgkyb.com/observation/20140724_5945.htm).

<sup>19</sup> Yibin Municipal Development and Reform Commission, “Sichuan Shale Gas E&P 2013 Work Plan released,” July 24, 2013, <http://fg.yb.gov.cn/content.jsp?classId=650702&newsId=351827>.

(5%).<sup>20</sup> The new company will focus on the shale gas project development in the Changning block. CNPC will sell its four existing wells in the block to the new company. However, it is unclear if CNPC will transfer/lease overall mining rights in the block to the new company.

Sichuan Changning Gas Company was the first joint venture between a provincial government and upstream producer to co-develop shale gas. The joint venture is endorsed by NEA and will receive policy support at the national, provincial and local levels.

(i) Chongqing

In February 2014, the Chongqing Fuling government published the Fuling Shale Gas Development and Usage Implementation Plan.<sup>21</sup> The Plan set a production target of 3.2 bcm by 2015 and other targets including 7.4 billion RMB of investment in shale gas industrial parks and infrastructure. The Plan includes details on environmental management as well.

In May 2014, Sinopec, Chongqing Gas Company (a provincial SOE) and the Fuling Government formed three joint ventures to develop shale gas in the Fuling District. The three joint ventures include Sinopec, Chongqing Fuling Shale Gas E&P Company, Sinopec Chongqing Gas Pipeline Company and Sinopec Chongqing Fuling Shale Gas Retail Company.<sup>22</sup>

In June 2014, Chongqing Finance Bureau has allocated 240 million RMB to support the Chongqing Shale Gas Resource Survey project, which aims to better understand the shale gas resources allocation in Chongqing.<sup>23</sup>

(iii) Guizhou

In January 2013, the Guizhou provincial government signed a Joint Development Framework with MLR to develop shale gas in Guizhou. The Framework sets forth a two-phase shale gas development plan in Guizhou. Between 2013 and 2015, surveys will be conducted and the first pilot wells drilled. Between 2016 and 2020, pilot projects will be constructed and commercial wells will be drilled.<sup>24</sup>

In May 2013, the Guizhou Fenggang county government published the Fenggang Shale Gas Exploration and Production Service Work Plan. The plan focuses on exploration work and helping the survey team.<sup>25</sup> In July 2013, the Guizhou Department of Land and Resources

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<sup>20</sup> Jianqiao Li, "CNPC Team Up with Sichuan; First Central SOEs and Local Government Shale Gas JV Incorporated," *21cbh.com*, December 12, 2013, <http://biz.21cbh.com/2013/12-12/0MNDE3Xzk4Mjl0MA.html>.

<sup>21</sup> Chongqing Fuling Government, "Fuling Shale Gas Development and Usage Implementation Plan," Feb. 10, 2014, <http://www.flagri.gov.cn/jiaoshi/Details.aspx?topicId=544965&ci=3192&psi=3408>

<sup>22</sup> Qi Yue, "Chongqing Formed JV to Develop Shale Gas with Sinopec," May 5, 2014, *NBD*, <http://www.nbd.com.cn/articles/2014-05-05/830769.html>

<sup>23</sup> Chongqing Finance Bureau, "240 million RMB allocation for Chongqing Shale Gas Resource Survey Project," June 2014, <http://www.cq.gov.cn/publicinfo/web/views/Show!detail.action?sid=3906008>.

<sup>24</sup> MLR, "MLR signed Shale Gas Joint Development Framework with Guizhou Provincial Government," January, 2013, [http://www.mlr.gov.cn/xwdt/jrxw/201301/t20130129\\_1179140.htm](http://www.mlr.gov.cn/xwdt/jrxw/201301/t20130129_1179140.htm).

<sup>25</sup> Fenggang Government, "Fenggang Shale Gas Exploration and Production Service Work Plan," May 02, 2013, <http://www.gzfenggang.gov.cn/xxgk/gsgg/zxwj/12531.shtml>.

completed the Guizhou Shale Gas Resource Survey project after 16 months of work. The project identified 17 high shale gas potential blocks in Guizhou.<sup>26</sup>

#### (iv) Other Provinces

Other shale-rich provinces have not yet published shale gas production plans. Xinjiang, which has considerable shale resources, has focused on its enormous coal and conventional gas resources instead. However, in April 2014, Xinjiang State-owned Assets Supervision and Administration Commission (SASAC) published the Xinjiang Uygur Autonomous Region SASAC Development Plan 2014–2020 (draft),<sup>27</sup> which emphasized that the government will gradually open the oil and gas resource development market. In May 2014, the Second National Xinjiang Work Forum indicated more Xinjiang local companies should be involved in the oil and gas resource survey work.<sup>28</sup> NDRC has confirmed Xinjiang as the first pilot province in oil and gas, and the National Energy Administration is issuing qualification licenses on oil exploration and development to five private companies.<sup>29</sup> If this process proceeds, it could break the monopoly of state-owned enterprises in the upstream oil and gas industry, accelerating development of all oil and gas, including shale gas.

In Shaanxi province, Yanchang Petroleum has conducted a shale gas pilot project and drilled 39 wells by the end of 2013.<sup>30</sup>

#### D. Natural Gas Price Reform

Historically, natural gas prices in China were regulated through the entire value chain. Complex reforms are now underway, with natural gas prices slowly moving toward international parity. As part of these reforms, the wellhead price of shale gas has been deregulated. However, the remaining price controls on conventional gas negatively impact shale gas producers, as explained below.

Until recently, natural gas wellhead prices, pipeline tariffs and end-user prices were all regulated by the central government:

- Wellhead prices were set by NDRC, based on production costs with a profit margin added. These approved prices served as a baseline, with suppliers and buyers free to negotiate increases of no more than 10%.<sup>31</sup>

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<sup>26</sup> Guizhou Department of Land and Resources, “Guizhou Shale Gas Resource Survey Project Passed Initial Assessment,” July 2, 2013,

[http://www.gzgtzy.gov.cn/Html/2013/07/02/20130702\\_103756\\_25035.html](http://www.gzgtzy.gov.cn/Html/2013/07/02/20130702_103756_25035.html).

<sup>27</sup> Zheling Zhou, “Positive Policy Changes Boosting Xinjiang’s Economy,” *China Securities Journal*, April 2014, [http://www.cs.com.cn/ssgs/gstt/201404/t20140415\\_4362990.html](http://www.cs.com.cn/ssgs/gstt/201404/t20140415_4362990.html).

<sup>28</sup> “Xi Jinping’s Speech at the Second National Xinjiang Work Forum,” May 29, 2014, <http://q.stock.sohu.com/news/cn/251/600251/3354260.shtml>.

<sup>29</sup> Guangkai Zhang, “Xinjiang Became the First Pilot Province on Oil and Gas Reform, Local Companies Are Welcomed to Join Oil and Gas Exploration,” *Guancha.com*, May 30, 2014, [http://www.guancha.cn/economy/2014\\_05\\_30\\_234013.shtml](http://www.guancha.cn/economy/2014_05_30_234013.shtml).

<sup>30</sup> “Overview and Outlook of China Shale Gas Exploration and Production in 2013,” *sina finance*, July 29, 2014, <http://finance.sina.com.cn/energy/industrydynamics/20140729/102819849264.shtml>.

<sup>31</sup> China Energy Fund Committee, at note 11.



- Pipeline tariffs were also determined by NDRC, based on three factors: cost, distance from gas field to city gate and a profit margin set at a guaranteed internal rate of return of 12%.<sup>32</sup>
- End-user prices added another layer of complexity, with variations depending on gas source and usage (e.g., residential, commercial, industry or fertilizer).

In July 2013, a nation-wide natural gas price reform was implemented by NDRC. These reforms were a move toward market pricing (but not simplicity). Prices for “old gas” — up to 2012 consumption levels — are now capped at 2012 prices plus increases of no more than 0.4 RMB/cubic meter per year. Prices for “new gas” — above 2012 consumption levels — are linked to prices for fuel oil and liquefied petroleum gas (LPG) based on heating values, with natural gas receiving a 15% discount.

Consistent with these reforms, in August 2014 NDRC announced that prices for non-residential “old gas” would be increased by 0.4 RMB/cubic meter — an average increase of roughly 20% from 2013 levels. Average city gate price for nonresidential “old gas” are now roughly 2.35 RMB/cubic meter (\$10.65/Mcf).<sup>33</sup> (Attachment C sets forth the city gate price cap for each province after the August 2014 adjustment.)

In addition, wellhead prices for shale gas (and other unconventional) have now been deregulated. Producers are free to negotiate market prices with non-residential buyers. However a number of factors have limited the practical utility of this reform:

- First, shale gas producers in some regions may have no access to pipelines in the short term, due to China’s limited pipeline network and the ability of pipeline owners to restrict third party access. Although shale gas can be transported as LNG in trucks, truck transport over long distances is expensive. That means that in practice shale gas producers may often be limited to industrial or commercial customers near the production site. These customers will drive a harder bargain on price, knowing the producer has few options for offtake.
- In addition, when shale gas succeeds in entering the pipeline system it will often mix with conventional natural gas, making price discrimination at the point of withdrawal difficult. Until very recently, shale gas in the pipeline system was still subjected to the city gate price regulations. In the August 2014 price reform, NDRC announced a new measure to address this problem, allowing buyers and sellers to negotiate a separate price for the exact volume of shale gas delivered into the pipeline system. This price is now allowed to be higher than the city gate price caps.<sup>34</sup>

Jianfeng Chemical, a local-government owned company in Chongqing, is reported to be the first industrial user of shale gas, partly because of its proximity to the shale gas wells in

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<sup>32</sup> Ibid., p.46.

<sup>33</sup> NDRC, “Notice to Adjust Non-residential Natural Gas Price,” [http://www.sdpc.gov.cn/gzdt/201408/t20140812\\_622009.html](http://www.sdpc.gov.cn/gzdt/201408/t20140812_622009.html); Xuequan Mu, “China to Raise Natural Gas Prices,” *Xinhua*, August 12, 2014, [http://news.xinhuanet.com/english/china/2014-08/12/c\\_126863237.htm](http://news.xinhuanet.com/english/china/2014-08/12/c_126863237.htm).

<sup>34</sup> Xuequan Mu, “China to Raise Natural Gas Prices,” *Xinhua*, August 12, 2014, [http://news.xinhuanet.com/english/china/2014-08/12/c\\_126863237.htm](http://news.xinhuanet.com/english/china/2014-08/12/c_126863237.htm).

Fuling. Between September 15 and December 31, 2013, Sinopec supplied Jianfeng Chemical with 119 million cubic meters of shale gas through a pipeline from Fuling Jiaoshi. In return, Jianfeng Chemical prepaid 214 million RMB (1.88 RMB/m<sup>3</sup>). However, Jianfeng Chemical and Sinopec have reportedly been unable to reach a final agreement on price.<sup>35</sup>

#### E. Pipeline Reform

Significant reforms are underway in the management of China's oil and gas pipelines. How far those reforms will go — or whether they will be enduring — is not yet known.

Traditionally more than 80% of China's oil and gas pipelines have been owned and operated by a single state-owned company — Petrochina (a subsidiary of CNPC). There was no regulatory authority to govern Petrochina's management of its pipeline assets or rules to require Petrochina to provide pipeline access to other companies. This created challenges for unconventional gas producers (among others), who found it difficult to reach transportation agreements with pipeline operators due to mismatched bargaining power.<sup>36</sup>

The coal-bed methane industry, for example, found it difficult to reach transportation agreements with pipeline operators. As a result, the industry turned to alternative methods of transportation, including liquefying coal bed methane and building new pipelines, which increased costs and slowed development.

However, the rules governing these pipelines are changing. In late 2013, NEA published draft opinions indicating that third parties should have access to natural gas pipelines and other related infrastructure with excess capacity on a non-discriminatory basis.<sup>37</sup> Then, in February 2014, NEA released two policies on natural gas pipelines:

- On February 13, NEA published regulations guaranteeing third-party producers access to oil and gas pipelines when there is excess capacity.<sup>38</sup> This policy has been described as a signal with respect to breaking the pipeline monopoly.<sup>39</sup> (However, in the short term, unconventional gas developers will still have challenges gaining access to pipelines, due to the limited spare capacity of the gas pipeline system.)
- On February 28, 2014, NDRC published guidance indicating that the government welcomes capital from different sources for investment in natural gas

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<sup>35</sup> Qi Yue, "Jianfeng Petrochemical's Price Dilemma Reflect the High Cost of Shale Gas," *NBD*, April 29, 2014, <http://www.nbd.com.cn/articles/2014-04-29/829757.html>.

<sup>36</sup> Fan Gao, *Will There be a Shale Gas Revolution in China by 2020?* (Oxford Institute for Energy Studies, April 2012), pp. 11–12, <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2012/04/NG-61.pdf>.

<sup>37</sup> NEA, "Oil and Gas Pipeline Could Soon Open to Third Parties," December 09, 2013, [http://www.nea.gov.cn/2013-12/09/c\\_132952957.htm](http://www.nea.gov.cn/2013-12/09/c_132952957.htm).

<sup>38</sup> NEA, "Measures for the Supervision of the Fair Access to the Oil and Gas Pipeline Facilities (for Trial Implementation)," Feb 13, 2014, [http://zfxgk.nea.gov.cn/auto92/201402/t20140224\\_1768.htm](http://zfxgk.nea.gov.cn/auto92/201402/t20140224_1768.htm).

<sup>39</sup> Xuan Jiang, "Market-oriented Operation Will Be Key to the Mix Ownership Reform of CNPC's Pipeline Assets," *CBM*, June 30, 2014, <http://www.yicai.com/news/2014/06/3985467.html/>.

infrastructure. The guidance requires local governments to supervise and facilitate the establishment and operation of natural gas infrastructure.<sup>40</sup>

In early May 2014, CNPC announced its intention to transfer its First and Second West-East Gas Pipelines assets to PetroChina Eastern Pipelines Co., a newly established and wholly-owned subsidiary. According to CNPC, these assets — valued at 82 billion RMB — will be sold through public tenders.<sup>41</sup> CNPC also responded to NEA’s regulations on third-party access by announcing that the company will open its oil and gas pipelines to third-party use.<sup>42</sup> On August 7, 2014, Xinhua reported that CNPC has set the basic principles for opening up its pipeline infrastructure to the market and pipeline capacity will be contracted on a “first-come, first-served” basis.<sup>43</sup>

On June 19, 2013, CNPC announced construction of China’s first shale gas pipeline, in Sichuan. The pipeline will be 93 kilometers (58 miles) long, with daily delivery capacity of 4.5 million cubic meters, connecting Sichuan Changning parcel to an existing natural gas pipeline to Yunan.<sup>44</sup> In May 2014, Sinopec announced plans to promote private investment in shale gas transportation.<sup>45</sup>

#### F. Chinese Investment in U.S. Shale Gas Plays

Chinese companies have invested more than \$8 billion in U.S. shale plays. CNOOC made the first major investment, buying a \$1.1 billion stake in Chesapeake’s Eagle Ford acreage in 2010 and then a \$1.3 billion stake in Chesapeake’s Colorado and Wyoming acreage in 2011.<sup>46</sup> Sinopec followed with two investments totaling roughly \$3.2 billion starting in 2012, in deals with Chesapeake and Devon. Sinopec’s investments are spread across Ohio, Michigan, Louisiana, Oklahoma and other states.<sup>47</sup> In May 2013, Sinochem and Pioneer

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<sup>40</sup> NDRC, “The Management Measures of Natural Gas Infrastructure Construction and Operation,” February 28, 2014, [http://www.sdpc.gov.cn/zcfb/zcfbl/201403/t20140320\\_603521.html](http://www.sdpc.gov.cn/zcfb/zcfbl/201403/t20140320_603521.html).

<sup>41</sup> Juan Du, “CNPC Moves to Open Pipeline Facilities,” *China Daily*, June 30, 2014, [http://usa.chinadaily.com.cn/epaper/2014-06/30/content\\_17626883.htm](http://usa.chinadaily.com.cn/epaper/2014-06/30/content_17626883.htm).

<sup>42</sup> Ibid.

<sup>43</sup> Xin Xu, “CNPC Sets Principles for Opening Up Pipelines,” *Xinhua*, August 7, 2014, [http://news.xinhuanet.com/english/china/2014-08/07/c\\_133540009.htm](http://news.xinhuanet.com/english/china/2014-08/07/c_133540009.htm).

<sup>44</sup> Yang Wang, “CNPC Started the First Shale Gas Pipeline Construction in China,” *Reuters*, June 19, 2013, <http://cn.reuters.com/article/cnMoneyNews/idCNL3S0EV1E520130619>.

<sup>45</sup> Chunlian Li, “CNPC Focuses on Pipeline Reforms While Sinopec Pushes for Shale Gas Development,” *China Economic Net*, May 28, 2014, [http://finance.ce.cn/rolling/201405/28/t20140528\\_2883573.shtml](http://finance.ce.cn/rolling/201405/28/t20140528_2883573.shtml).

<sup>46</sup> Chesapeake Energy Corporation, “Chesapeake Energy Corporation and CNOOC Limited Announce Eagle Ford Shale Project Cooperation Agreement” (October 10, 2010), <http://www.chk.com/news/articles/pages/1480846.aspx>; Paritosh Bansal and Farah Master, “Chesapeake, CNOOC Strike Second Shale Deal for \$1.3 bln” (January 30, 2011), <http://www.reuters.com/article/2011/01/31/cnooc-chesapeake-idUKN3017000120110131>.

<sup>47</sup> Devon Energy Corporation, “Devon Energy Announces \$2.2 Billion Transaction on Five New Venture Plays” (January 3, 2012), <http://www.devonenergy.com/newsroom/Pages/NewsRelease.aspx?id=1644020#terms?disclaimer=yes>; Chesapeake Energy Corporation, “Chesapeake Energy Corporation Announces Closing of Mississippi Lime Joint Venture with Sinopec” (July 1, 2013), <http://www.chk.com/news/articles/Pages/1834132.aspx>.

Natural Resources reached a \$1.7 billion deal for Texas acreage.<sup>48</sup> In late 2012, Lanzhou Haimo Technologies Co. announced a joint venture with Carrizo Oil & Gas in the Niobrara Basin, becoming the first private Chinese company to enter U.S. shale gas exploration.<sup>49</sup>

The motives for these investments are mostly unstated. However many experts believe that Chinese companies are seeking a combination of financial returns, investment diversification and technology.<sup>50</sup> Investing in U.S. shale gas plays may also help familiarize Chinese companies with U.S. regulatory and managerial practices in the shale gas sector.<sup>51</sup> In announcing CNOOC's first deal with Chesapeake, CNOOC Limited CEO Yang Hua said, "The execution of this project will benefit CNOOC Limited's long term production and reserves growth and should produce considerable returns for our shareholders."<sup>52</sup>

In general, Chinese investors in U.S. shale gas plays have not negotiated for technology license rights or the right to jointly operate gas fields. Chesapeake's former CEO Aubrey McLendon, speaking about CNOOC's role in projects where Chesapeake and CNOOC would have joint interests, was quoted as saying, "They'll have to watch from afar."<sup>53</sup>

The United States government has a strong commitment to open investment. The Committee on Foreign Investment in the United States (CFIUS) — a U.S. government interagency committee chaired by the Treasury Department — has authority to deny approval for foreign investments in U.S. companies in certain limited situations involving threats to national security. There is no record of CFIUS objecting to any Chinese investment in the U.S. shale gas sector.

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<sup>48</sup> Pioneer Natural Resources Company, "Pioneer Natural Resources Announces Closing of \$1.7 Billion Horizontal Wolfcamp Shale Transaction with Sinochem" (May 31, 2013),

<http://investors.pxd.com/phoenix.zhtml?c=90959&p=irol-newsArticle&ID=1825928&highlight=>

<sup>49</sup> "China's Haimo Seals US Shale Gas Stake" (October 26, 2012), *Chinadaily*,

[http://usa.chinadaily.com.cn/business/2012-10/26/content\\_15849981.htm](http://usa.chinadaily.com.cn/business/2012-10/26/content_15849981.htm); Haimo, *Company Overview*, <http://www.haimo.com.cn/about.aspx?treeid=287&fatherid=260>.

<sup>50</sup> Interviews by authors; see also Angel Gonzalez and Ryan Dezember, "Sinopec Enters U.S. Shale" (January 4, 2012), *WSJ*,

<http://online.wsj.com/news/articles/SB10001424052970203550304577138493192325500>.

<sup>51</sup> Author interviews. See also comments of Steven Lewis in

<http://www.monitorglobaloutlook.com/Briefings/2014/07/US-sanctions-complicate-CNPC-entry-into-US-shale-market>.

<sup>52</sup> Chesapeake Energy Corporation, "Chesapeake Energy Corporation and CNOOC Limited," in note 87.

<sup>53</sup> Angel Gonzalez, "China Turns to Texas for Drilling Know-How," *Wall Street Journal* (December 12, 2010), *WSJ*

<http://online.wsj.com/news/articles/SB10001424052748703358504575545183782651388>.